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| 10/683,774 | 10/10/2003 | Gail A. Alverson | 324758001US5 | 1801 |

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PERKINS COIE LLP
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

| EXAMINER | |
|---|---|
| WILSER, MICHAEL P | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/683,774 | ALVERSON ET AL. | |
| | Examiner | Art Unit | |
| | Michael Wilser | 2109 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *10 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10/10/03, 8/27/04, 10/7/04, 6/9/05, 7/13/06, & 3/2/07.

## DETAILED ACTION

This action is in response to the original filing of September 10, 2003. Claims 1-66 are pending and have been considered below.

### *Information Disclosure Statement*

1. The information disclosure statement filed September 29, 2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. The IDS claims that all foreign documents and non-patent literature are contained in the original filing of the parent application No. 09/192,205 filed on November 13, 1998. But, all of the documents listed on the IDS are not present in this application. The prior application only has 33 documents associated with it whereas the current applications IDS lists 50 documents. The missing documents need to be filed to be considered for examination.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 506 on page 18 paragraph 61 line 10, 1601 on page 26, paragraph 75 line

4, 1602 on page 26 paragraph 75 line 4, 1000 on page 26 paragraph 75 line 9, 1703 on page 30 paragraph 82 line 3, and 1702 on page 30, paragraph 82 line 4.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 1004 in Figure 10, 1100 in Figure 16A, 1300 in Figure 16A, 1502 in Figure 17, and 1503 in Figure 17.

4. The drawings are objected to because each individual item within a figure is supposed to be labeled with a reference character. In Figure 16B there are no reference characters in the drawing. The main heading at the top of the drawing needs to be numbered and so do the other parts of the table if they are separate features from the main heading.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1502 and 1503" has been used to designate both "add thread to blocked pool" and "invoke virtual processor code" in Figure 15 and "unwind stack frames" and "indirect longjmp" in Figure 17 respectively. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

7. The disclosure is objected to because of the following informalities: the examiner notes the use of acronyms (e.g. slim, scur, and sres) throughout the specification without first including a description in plain text, as required. Even though these acronyms are later explained they have to have their meaning given the first time they are used.

8. On page 18 of the specification on line 29 the specification reads "In step 516, the routine clears the team swap header". Then two lines later in line 31 the specification repeats the exact same sentence word for word. Since step 516 comes

after step 515 and does not loop back around to step 514 the examiner is interpreting the first instance of this line as being a typo and incorrectly inserted. When comparing to Figure 5B the specification as interpreted as a series from 514 to 515 to 516 and therefore the first mention of 516 on line 29 should be removed from the specification.

9. On page 22 of the specification paragraph 69 line 17 the specification reads "amount greater that the slim value". The examiner is interpreting this as a typo and that the specification should have read "amount greater than the slim value".

10. On page 27 of the specification paragraph 76 the applicant references Figure 16B and discusses different features of the figure in detail. However, the applicant omits reference numbers to the figure that is being discussed. The applicant needs to add reference numbers to the specification so that one of ordinary skill in the art can read he specification and easily flip back and forth between the drawings and specification with minimal confusion.

Appropriate correction is required.

## *Claim Rejections - 35 USC § 102*

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-9, 15, 17-28, 34-42, 48, and 50-61 are rejected under 35 U.S.C. 102(e) as being anticipated by Slingwine et al. (US 6,219,690).

Claims 1 and 34: Slingwine discloses a method and system for placing a task with multiple threads in a known state (column 2, lines 62-67 & column 3, lines 1-10) comprising:

a. notifying each thread of a task to enter a known state (column 10, lines 36-43); and

b. entering the known state so that an action can be performed with the task in the known state (column 2, lined 62-67 & column 3, lines 1-10).

Claims 23 and 56: Slingwine discloses a method and system for removing a task with multiple threads from a known state (column 2, lines 62-67 & column 3, lines 1-10) comprising:

a. notifying each thread of a task to exit the known state (column 5, lines 18-25); and

b. executing instructions that were to be executed before the thread entered the known state (column 8, lines 54-61).

Claims 2, 24, 35, and 57: Slingwine discloses of a method and system as in Claims 1, 34, 23, and 56 above, and further discloses that the known state is a quiescent state (column 3, lines 43-45).

Claims 3, 25, 36, and 58: Slingwine discloses a method and system as in Claims 1, 23, 34, and 56 above, and further discloses that the known state is when the thread is executing idle instructions (column 2, lines 62-67 & column 3, lines 1-10).

Claims 4, 26, 37, and 59: Slingwine discloses of a method and system as in Claims 1, 23, 34, and 56 above, and further discloses that the known state is when threads stop executing instructions (column 2, lines 62-67 & column 3, lines 1-10).

Claims 5 and 38: Slingwine discloses of a method and system as in Claims 1 and 34 above, and further discloses of assigning the task to a protection domain (processor) and raising a signal (flagging) the protection domain (column 6, lines 41-50).

Claims 6 and 39: Slingwine discloses a method and system as in Claims 1 and 34 above, and further discloses that prior to entering the known state the thread saves its state (column 10, lines 8-17).

Claims 7 and 40: Slingwine discloses of a method and system as in Claims 1 and 34 above, and further discloses that the thread initiates the notifying (column 5, lines 46-49).

Claims 8 and 41: Slingwine discloses a method and system as in Claims 7 and 40 above, and further discloses that the thread initiates the notifying by sending a request to the operating system (column 7, lines 56-67).

Claims 9 and 42: Slingwine discloses a method and system as in Claims 7 and 40 above, and further discloses that the thread notifies the operating system that it is blocked from productive use before entering the known state (column 7, lines 56-67).

Claims 15 and 48: Slingwine discloses of a method and system as in Claims 1 and 34 above, and further discloses that the action is to process a signal by the operating system (column 7, lines 56-67).

Claims 17, 27, 50, and 60: Slingwine discloses a method and system as in Claims 1m 23m 34m and 56 above, and further discloses that the known state is waiting on synchronization indication (column 2, lines 8-26).

Claims 18 and 51: Slingwine discloses of a method and system as in Claims 17 and 50 above, and further discloses that the waiting is performed by accessing memory location of future synchronization information (column 8, lines 49-53).

Claims 19 and 52: Slingwine discloses of a method and system as in Claims 1 and 34 above, and further discloses that the known state includes invoking an operating system call (column 7, lines 56-67).

Claims 20 and 53: Slingwine discloses of a method and system as in Claims 1 and 34 above, and further discloses that the thread notifies the operating system of when the thread is in a known state (column 7, lines 56-67).

Claims 21 and 54: Slingwine disclose of a method an system as in Claims 1 and 34 above, and further discloses that when a thread is processing a signal the other threads are n a quiescent state (column 8, lines 35-40).

Claims 22 and 55: Slingwine discloses of a method and system as in Claims 21 and 34 above, and further disclose that after processing the signals each thread exits the known state (column 2, lines 62-67 & column 3, lines 1-10).

Claims 28 and 61: Slingwine discloses of a method and system as in Claims 27 and 60 above, and further discloses that the notifying includes indicating the synchronization (column 8, lines 49-53).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 10-14, 29-31, 43-47, and 62-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slingwine et al (US 6,219,690) in view of Alpert et al. (US 5621,886).

Claims 10 and 43: Slingwine discloses a method and system as in Claims 1 and 34 above, but does not explicitly discloses that the action to be performed is swapping the task out of processor utilization. However, Alpert discloses of a similar method and system in which the tasks are swapped in and out of the processor (column 3, lines 6-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to swap the tasks out of the processor in Slingwine. One would have been motivated to swap the tasks from processor utilization since tasks are often left waiting for a resource and if left in the processor utilization will cause the processor to slow down and lower the throughput of the entire system.

Claims 11 and 44: Slingwine and Alpert disclose of a method and system as in Claims 10 and 43 above, and Slingwine further discloses that before entering a known state the thread saves its state information (column 10, lines 8-17).

Claims 12 and 45: Slingwine discloses a method and system as in Claims 1 and 34 above, but does not explicitly disclose of reviewing the state information of each thread. However, Alpert discloses of a similar method and system in which the state information of each thread is reviewed (column 3, lines 6-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have reviewed the state information in Slingwine. One would have been motivated to review the state information to verify that the actions the thread had taken before entering the known state were in line with the expected results from the particular task.

Claims 13 and 46: Slingwine and Alpert disclose of a method and system as in Claims 12 and 45 above, and Alpert further discloses of reviewing the state information using a debugger (column 3, lines 6-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to review the state information of Slingwine in a debugger. One would have been motivated to review the state information in a debugger so that any errors that had occurred in the execution of the task up to that point could be checked and fixed before returning the thread to its old state.

Claims 14 and 47: Slingwine and Alpert disclose of a method and system as in Claims 13 and 46 above, and Alpert further discloses of the debugger executing threads of a task that do not enter a known state column 2, lines 39-67 & column 3, lines 1-5).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have executed threads in a debugger in Slingwine. One would have been motivated to execute the threads in a debugger that didn't enter a known state so errors that had occurred in the execution of the task up to that point could be checked and fixed.

Claims 29 and 62: Slingwine discloses a method and system as in Claims 23 and 56 above, but does not explicitly discloses that the thread restores state information that was saved before entering the known state. However, Alpert discloses of a similar method and system in which the state information of a thread is later restored (column 3, lines 6-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to restore the saved state information in Slingwine. One would have been motivate to restore the saved state information so that the thread could return to its previous executing place with access to its previous actions that it performed before entering the known state.

Claims 30 and 63: Slingwine and Alpert disclose of a method and system as in Claims 29 and 62 above, and Slingwine further discloses that one threads performs signal processing upon exiting the known state (column 8, line3 35-40).

Claims 31 and 64: Slingwine and Alpert disclose of a method and system a sin Claims 30 and 63 above, and Slingwine further discloses that threads wait until signals are

processed before executing instructions that were to be executed before entering the known state (column 8, lines 54-61).

15. Claims 16 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slingwine et al. (US 6,219,690) in view of Potash (US 2002/0103847).

Claims 16 and 49: Slingwine discloses of a method and system as in Claims 1 and 34 above, but does not explicitly disclose of performing an inter-thread long jump. However, Potash discloses of a similar method and system that does perform an inter-thread jump (page 2, paragraph 12). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to perform a thread jump in Slingwine. One would have been motivated to perform an inter-thread jump so that the processor could follow the progression f the thread and jump ahead to continue processing if an error had occurred.

16. Claims 32-33 and 65-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slingwine et al. (US 6,219,690) in view of Shrote (US 5,774,358).

Claims 32 and 65: Slingwine discloses of a method and system as in Claims 23 and 56 above, but does not explicitly disclose of reserving a number of streams for the task. However, Shrote discloses of a similar method and system in which streams are reserved for the task (column 12, lines 44-58). Therefore, it would have been obvious to

one having ordinary skill in the art at the time of invention to have reserved streams for the task in Slingwine. One would have been motivated to reserve streams for the task so that once the task has exited the known state it can renter the processor and continue processing.

Claims 33 and 66: Slingwine discloses of a method and system a sin Claims 23 and 56 above, but does not explicitly disclose of the tasks creating streams for the threads. However, Shrote discloses of a similar method and system in which the tasks do create streams for the threads (column 12, lines 44-58). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the tasks create streams in Slingwine. One would have been motivated to create stream so that once the thread has exited the known state it can renter the processor and continue processing.

## *Conclusion*

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Oba et al. (US 6,529,958) Label switched path set up scheme with reduced need for label set up retry operation.

b. Wimble et al. (US 5,778,230) Goal directed object-oriented debugging system.

c. Bayeh (US 6,223,202) Virtual machine pooling.

d. Alpert et al. (US 5,740,413) Method and apparatus for providing address breakpoints, branch breakpoints, and single stepping.

e. Cohen (US 5,257,358) Method for counting the number of program instruction completed by a microprocessor.

f. Hobbs et al. (US 5,197,138) Reporting delayed coprocessor exceptions to code threads having caused the exceptions by saving and restoring exception state during code thread switching.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Wilser whose telephone number is (571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00 EST (Alt Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on (571) 270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MPW
May 10, 2007

James Myhre
Supervisory Patent Examiner